William F. Adler Executive Director Federal Regulatory Relations 1275 Pennsylvania Avenue, N.W., Suite 400 Washington, D.C. 20004 (202) 383-6435

December 11, 1992



PACIFIC TELESIS.

Group-Washington

RECEIVED

DEC 1 1 1992

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Donna R. Searcy Secretary Federal Communications Commission Mail Stop 1170 1919 M Street, N.W., Room 222 Washington, D.C. 20554

William J. Adler

Dear Ms Searcy:

Re: ET Docket No. 92-9 Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies

On behalf of Pacific Telesis Group, please find enclosed an original and six copies of its "Comments" in the above proceeding.

Please stamp and return the provided copy to confirm your receipt. Please contact me should you have any questions or require additional information concerning this matter.

Sincerely,

Enclosures

No. of Copies rec'd 0+5 List A B C D E

RECEIVED

DEC 1 1 1992

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Before the FEDERAL COMMUNICATIONS COMMISSION Washington, D.C. 20554

In the Matter of)	
)	
Redevelopment of Spectrum to)	ET Docket No. 92-9
Encourage Innovation in the)	
Use of New Telecommunications)	RM-7981
Technologies)	RM-8004

COMMENTS OF PACIFIC TELESIS GROUP

Pacific Telesis Group ("Pacific") submits its comments on the Commission's proposed Further Notice Of Proposed Rulemaking, released September 9, 1992 in the above-captioned docket. The Commission proposes rules to govern the frequencies for 2 GHz licenses which will be reallocated to five bands above 3 GHz to provide spectrum for emerging technologies. Specifically, these rules follow from the Petitions For

Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies, ET Docket No. 92-9, RM-7981, RM-8004; Notice of Proposed Rulemaking, 7 FCC Rcd 1542 (1992); Further Notice of Proposed Rulemaking, 7 FCC Rcd 6100 (1992) (**FNPRM**); First Report and Order and Third Notice of Proposed Rulemaking, FCC 92-437, released October 16, 1992.

Rulemaking by UTC² and Alcatel.³ Pacific expressed agreement with the Alcatel Petition but raised serious reservations about several aspects of the Petition.⁴ The FNPRM appears to endorse Alcatel's Petition including those aspects objected to by Pacific in its Comments on the Petition.

Pacific strongly opposes the Commission's proposals that will 1) permit Part 94 private licensees to use frequencies previously open only to common carriers, 2) rechannel the broadband frequency pairs by overlaying narrowband channels, and 3) limit the period during which frequencies can be reserved for future growth to as short as six months.

Pacific believes the net result of these changes will be the virtual disappearance of broadband frequency slots in or near many metropolitan areas.

I. PERMITTING PRIVATE USERS INTO THE COMMON CARRIER WILL SEVERELY AFFECT SPECTRUM AVAILABLE FOR COMMON CARRIER USE

Allowing the private microwave user into the common carrier portion of the 6 and 11 GHz bands can be expected to

²Amendment of Parts 2, 21, and 94 of the Commission's Rules to Accommodate Private Microwave Systems in the 1.71-1.85 GHz Band and In Bands Above 3 GHz, Utilities Telecommunications Council, RM-7981, March 31, 1992 ("UTC").

³Amendment of Parts 2, 21, 25 and 94 of the Commission's Rules to Accommodate Common Carrier and Private Op-Fixed Microwave Systems in Bands Above 3 GHz, Alcatel Network Systems, Inc., RM-8004, May 22, 1992 ("Alcatel").

⁴Comments of Pacific Telesis Group, July 2, 1992.

severely deplete the amount of spectrum available for common carrier use. Private microwave users are heavy consumers of spectrum, not for lack of alternatives to microwave radio, but because microwave radio may be a cheap alternative. While economics is an important factor in the facility-selection process, Pacific questions the wisdom of allowing the use of microwave radio in those many locations where terrestrial facilities are immediately available. The Commission expressly encourages users to migrate to other, non-radio alternative media in order to preserve spectrum. Pacific is skeptical that private users will respond to this important suggestion. The result of authorizing private users to use common carrier frequencies will be the rapid and uneconomical depletion of the limited resources for common carriage, a result which is not in the public interest.

II. RECHANNELIZING BROADBAND FREQUENCY PAIRS BY OVERLAYING NARROWBAND CHANNELS PROMOTES BROADBAND UNDERUTILIZATION

In its responses to the Alcatel Petition, Pacific objected to subdividing 30 MHz channels into 10 MHz channels. 6 This objection should not be disregarded. If large numbers of common carriers or private users are allowed to use narrowband frequency pairs that are superimposed or overlap portions of

⁵NPRM, p. 10, n.17.

⁶PTG Comments, p. 3.

broadband (30 MHz) frequency pairs, the entire common carrier band could be "balkanized" by these narrowband users to the point where the optimum use of the 6 and 11 GHz bands would be impossible. Instead of 30 MHz channels being loaded to or near capacity (84 DS-1s), the proposed 10 MHz sliver channels will more likely be used, each transporting but a fraction of the robust number possible.

Pacific suspects that the Commission's required minimum loading levels would not be met by many of the current licensees within both the common carrier and the private point-to-point microwave services. The splintering of the 6 and 11 GHz channels will lead to further underutilization of this valuable and diminishing resource.

The efficient administration of the proposed 10 MHz channels will be a vexing problem. For instance, in the proposed reallocation of the 6 and 11 GHz common carrier bands, nothing prevents a user from selecting the center of a 10 MHz slot which is superimposed over the middle of a 30 MHz frequency channel. This positioning not only forecloses the use of the broadband channel, but may also prevent the use of either of the other 10 MHz frequency slots in this 30 MHz slot because of adjacent channel and polarization constraints. The result will be a lightly-loaded 10 MHz channel tying up a 30 MHz frequency slot. The Commission must not establish rules that encourage (and make highly likely) the inefficient use of the 6 and 11 GHz common carrier bands.

In addition to users who legitimately need a full 10 MHz of bandwidth, there will be users tempted to bend the minimum loading requirements by overstating their current use or growth projections in order to qualify for a frequency slot. In light of limited resources, which are in ever-increasing demand, the Commission may not wish to devote those resources to monitor or police such actions.

The Commission should disregard the suggestion that there is a diminishing need for 30 MHz broadband channels. Pacific Bell's recent employment of both 6 and 11 GHz channels gives strong testimony to the contrary.

Pacific believes the only way to retain future broadband capability is to reserve at least half of the current 6 and 11 GHz common carrier bands exclusively for broadband (30 MHz) frequency pairs. This will ensure at least some broadband channelization capability and thus secure a more efficient use of the frequency spectrum.

III. A POLICY OF RESERVING FREQUENCIES FOR A PERIOD AS SHORT AS SIX MONTHS IS UNWORKABLE FOR COMMON CARRIERS

The proposal that future channels be reservable for periods as short as six months is unworkable. A six-month period simply forecloses a carrier's use of 6 and 11 GHz microwave radio as a means of providing facilities based on customer demand and rational planning. Established wireline common carriers like Pacific Bell are in the business of wireline telephone communications as a long-term method of providing service to

their customers. It would be unreasonable to expect Pacific Bell to plan and invest in a microwave radio route, given the limit of reserving frequencies for known future growth to as brief a time as six months.

IV. CONCLUSION

The effect of the foregoing proposed rule changes is likely to be that the large common carrier will be foreclosed from the efficient employment of microwave radio as a means of providing customer required facilities. Pacific, therefore, urges the Commission to modify the proposed rules to permit the reservation of some 6 GHz frequencies for common carrier use only, to reserve a significant amount of the current 6 and 11 common carrier bands exclusively for broadband frequency pairs and to establish longer periods, or express renewal authorization, to reserve future growth channels.

Respectfully submitted,
PACIFIC TELESIS GROUP

MARGARET deb. BROWN

130 Kearny Street, Room 3659 San Francisco, CA 94108 (415) 394-3550

LUCILLE M. MATES

140 New Montgomery St., Room 1526 San Francisco, CA 94105 (415) 542-7654

ITS ATTORNEYS

Dated: December 11, 1992

CERTIFICATE OF SERVICE

I, Cathy Jo Farey, hereby certify that a copy of the foregoing Comments of Pacific Telesis Group was mailed first-class United States mail, postage prepaid, this 11th day of December, 1992 to the parties listed on the attached service list.

Carry Jo Farey

G. Patrick Flowers Enron Interstate Pipelines P.O. Box 1188 Houston, Tx 77251-1188

James F. Rogers Latham & Watkins 1001 Pennsylvania Ave., N.W. Suite 1300 Washington, DC 20005-2404

Carole C. Harris Keller and Heckman 1001 G Street, N.W. Suite 500 West Washington, DC 20001

Arthur K. Neill Utility Services 40 East Broadway Butte, MN 59701

Francine J. Berry AT&T 295 North Maple Avenue Room 3224J1 Basking Ridge, NJ 07920

Donald L. Schilling SCS Mobilecom, Inc. 85 Old Shore Rd., Suite 200 Port Washington, NY 11050

Jeffrey L. Sheldon Utilities Telecommunications Council 1140 Connecticut Ave., N.W. Suite 1140 Washington, DC 20036

Arthur Blooston Blooston, Mordkofsky, Jackson & Dickens 2120 L Sreet, N.W. Suite 300 Washington, DC 20037

Andrew D. Lipman Swidler & Berlin 3000 K Street, N.W. Suite 300 Washington, DC 20007-3851

George Y. Wheeler Koteen & Naftalin 1150 Connecticut Avenue, N.W. Washington, DC 20036 James F. Lovette Apple Computer, Inc. 20525 Mariani Avenue, M.S. 76-2H Cupertino, CA 95014

Phyllis E. Hartsock NTIA U.S. Department of Commerce Room 4713 14th & Constitution Ave., N.W. Washington, DC 20230

Jonathan D. Blake Covington & Burling 1201 Pennsylvania Avenue, N.W. Post Office Box 7566 Washington, DC 20044

Wayne B. Black Keller and Heckman 1001 G Street, N.W. Suite 500 West Washington, DC 20001

Thomas J. Keller Verner, Liipfert, Bernhard, McPherson and Hand 901 15th Street, N.W. Suite 700 Washington, DC 20005

Thomas J. Casey Skadden, Arps, Slate, Meagher & Flom 1440 New York Avenue, N.W. Washington, DC 20005

Thomas J. Keller Verner, Liipfert, Bernhard, McPherson and Hand 901 15th Street, N.W. Suite 700 Washington, DC 20005

Stephen Ruud Public Utilities Commission of the State of Colorado Logan Tower, OL-2 1580 Logan St. Denver, CO 80203

Tom W. Davidson Akin, Gump, Hauer & Feld 1333 New Hampshire Avenue, N.W. Suite 400 Washington, DC 20036 Raymond G. Bender, Jr. Dow, Lohnes & Albertson 1255 Twenty-third St., N.W. Washington, DC 20037

Charles F. Wright Centel Corporation 8725 Higgins Road Chicago, IL 60631

Gregory M. Schmidt Covington & Burling 1201 Pennsylvania Avenue, N.W. Post Office Box 7566 Washington, DC 20044

Jan J. Sagett Edison Electric Institute 701 Pennsylvania Avenue, N.W. Washington, DC 20004-5616

John D. Lane Wilkes, Artic, Hedrick & Lane 1666 K Street, N.W. Washington, DC 20006

Randolph J. May Sutherland, Asbell & Brennan 1275 Pennsylvania Ave., N.W. Washington, DC 20004

James A. Vann, Jr. Alabama Electric Cooperative, Inc. P.O. Box 550 Andalusia, AL 36420

Brice L. Clark Hewlett-Packard Company 800 Foothills Blvd. Roseville, CA 95678

George Y. Wheeler Koteen & Naftalin 1150 Connecticut Avenue, N.W. Washington, DC 20036

James D. Ellis Southwestern Bell One Bell Center Room 3524 St. Louis, MO 63101-3099 Howard Oringer Telesciences, Inc. 600 Montgomery St. San Francisco, CA 94111

Thomas A. Stroup Telocator 1019 19th Street, N.W., Suite 1100 Washington, DC 20036

Mark R. Hamilton McCaw Cellular Communications, Inc. 1250 Connecticut Ave., N.W. Suite 401 Washington, DC 20036

Michael D. Kennedy Motorola, Inc. 1350 I Street Suite 400 Washington, DC 20005

Leonard Robert Raish Fletcher, Heald & Hildreth 1225 Connecticut Avenue, N.W. Suite 400 Washington, DC 20036

Shirley S. Fujimoto Keller and Hackman 1001 G Street, N.W. Suite 500 West Washington, DC 20001

Dale V. Fetchenhier Public Service Company of Colorado 1225 17th Street, N.W., Suite 600 Denver, CO 80202

George DuBois 10048 NE Campaign Street Portland, OR 97220-3534

John P. Bankson, Jr. Hopkins & Sutter 888 16fth St., N.W. Washington, DC 20006

Eric Schimmel
Telecommunications Industry
Association
Mobile Communications Division
2001 Pennsylvania Avenue, N.W.
Suite 800
Washington, DC 20006

Williams Natural Gas Company Post Office Box 3288 Tulsa, OK 74102

Lawrence A. Gollomp Office of the General Council United States Department of Energy 1000 Independence Avenue, S.W. DOE Mil Stop GC-33, Room 6D--33 Washington, DC 20585

Ralph C. Burke Jefferson Electric Membership Corporation P.O. Box 312 Louisville, GA 30434

Michael D. Weiblen Medina Electric Cooperative, Inc. 2308 18th Street P.O. Box 370 Hondo, TX 78861

Thomas E. Stephens Public Service Commission of Nevada 727 Fairview Drive Carson City, NV 89710

Don O. Tellis Arizona Public Service Company P.O. Box 53999 Phoenix, AZ 85072-3999

Steven Sivitz ROLM 4900 Old Ironsides Dr. Santa Clara, CA 95052-8075

Harry D. Mattison Central and South West, Inc. 1616 Woodall Rodgers Fwy Dallas, TX 75202

Paul J. Sinderbrand Keck, Mahin & Cate 1201 New York Avenue, N.W. Penthouse Washington, DC 20005-3919

Coleman Conrad The City of San Diego City Administration Building 202 C Street San Diego, CA 92101 Pamela L. Gist Lukas, McGowan, Nace & Gutierrez 1819 H Street, N.W. Seventh Floor Washington, DC 20006

George F. Bailey County of San Diego County Administration Center 1600 Pacific Highway Room 335 San Diego, CA 92101

Richard M. Stokes Atlantic Electric 1199 Black Horse Pike Pleasantville, NJ 08232

Eva Lerner-Lam The Palisades Group 85 Palmer Avenue Trenton, NJ 07670

L. L. Hallman Arizona Department of Public Saftey 2102 West Encanto Blvd. P.O. Box 6638 Phoenix, AZ 85005-6638

Sam R. Jones Electric Utility Department 721 Barton Springs Road Austin, TX 78704

Tel/Logic Inc. 51 Shore Drive Plandome, NY 11030

Stephen A. Hilldebrandt Westinghouse Broadcasting Company, Inc. 400 North Capito Street, N.W. Washington, DC 20001-1511

Richard H. Bremer Southwestern Electric Power Company 428 Travix St. Shreveport, LA 71101

Lisa M. Zaina OPASTCO 21 Dupont Circle, N.W. Suite 700 Washington, DC 20036 Robert J. Miller Gardere & Wynne, L.L.P. 1601 Elm Street Suite 3000 Dallas, TX 75201

American Public Power Association 2301 M Street, N.W. Suite 300 Washingon, DC 20037

Jerome K. Blask Gurman, Kurtis, Blask & Freedman 1400 16th Street, N.W. Suite 500 Washington, DC 20036

Henry L. Baumann National Association of Broadcasters 1771 N Street, N.W. Washington, DC 20036

Bruce Collins Cable-Satellite Public Affairs Network 400 North Capital, N.W. Washington, DC 20001

L. Christian Hauck Sunflower Electric Power Corporation Post Office Box 980 Hays, KS 67601

Bob Bergland National Rural Electric Cooperative Association 1800 Massachusetts Avenue, N.W. Washington, DC 20036-1883

Jerome K. Blask Gurman, Kurtis, Blask & Freedman 1400 16th Street, N.W. Suite 500 Washington, DC 20036

William K. Drummand Public Power Council 500 N.E. Multnomah Suite 729 Portland, OR 97232

Douglas Smith Omnipoint Corporation 7150 Campus Drive Colorado Springs, CO 80920 M. J. Macdonald Seattle City Light 1015 Third Avenue Seattle, WA 98104

Paul Taft Texas Wired Music 4808 San Felipe Road Houston, TX 77056

Bruce D. Jacobs Fisher, Wayland, Cooper & Leader 1255 23rd Street, N.W. Suite 800 Washington, DC 20037

Wayne V. Black Keller and Heckman 1001 G Street, N.W. Suite 500 West Washington, DC 20001

J. Laurent Scharff Reed Smith Shaw & McClay 1200 18th Street, N.W Washington, DC 20036

Thomas Gutierrez Lukas, McGowan, Nace & Gutierrez 1819 H Street, N.W. 7th Floor Washington, DC 20006

A. Laurence Ralph Central Maine Power Company Edison Drive Augusta, ME 04336

Bruce D. Jacobs Fisher, Wayland, Cooper & Leader 1255 23rd Street, N.W. Suite 800 Washington, DC 20037

Thomas Guiterrez Lukas, McGowan, Nace & Guitierrez 1819 H Street, N.W. 7th Floor Washington, DC 20006

Thomas Guiterrez Lukas, McGowan, Nace & Guitierrez 1819 H Street, N.W. 7th Floor Washington, DC 20006 Tom Alberg McCaw Cellular Communications, Inc. 5400 Carillon Point Kirkland, WA 98033

Edward R. Wholl NYNEX Mobile Communications Company 2000 Corporate Drive Orangeburg, NY 10962

Laura H. Phillips Dow, Lohnes & Albertson 1255 23rd Street Suite 500 Washington, DC 20037

Christopher D. Imlay Booth, Freret & Imlay 1233 20th Street, N.W. Suite 204 Washington, DC 20336

Harold Mordkofsky Blooston, Mordkofsky, Jackson & Dickens 2120 L Street, N.W. Suite 300 Washington, DC 20037

Robert R. Carey Central Power and Light Company 539 North Carancahua Street Corpus Christi, TX 78401

Cheryl Lynn Schneider Communications Satellite Corporation 950 L'Enfant Plaza, S.W. Washington, DC 20554

William B. Barfield BellSouth Corporation Suite 1800 1155 Peachtree Street, N.E. Atlanta, GA 30367-6000

Nicholas W. Hetman Texas Gas Transmission Corporation 3800 Frederica Street Owensboro, KY 42301

Harold Mordkofsky Blooston, Mordkofsky, Jackson & Dickens 2120 L Street, N.W. Suite 300 Washington, DC 20037 Richard Brass Oracle Data Publishing, Inc. 500 108th Avenue, N.E. Suite 1750 Bellvue, WA 98004-5500

Donald C. Loughry Hewlett-Packard Company 19420 Homestead Road, M/S 43UC Cupertino, CA 95104

D. W. Bateman Salt River Project Post Office Box 5205 Phoenix, AZ 85072-2025

John McNulty Rose Communications Inc. 2390 Walsh Ave. Santa Clara, CA 95051

Josephine S. Trubek Rochester Telephone Corporation 180 South Clinton Avenue Rochester, NY 14646

Harry A. Haycock PacifiCorp 2300 One Utah Center Salt Lake City, UT 84140

Martin T. McCue United States Telephone Association 900 19th Street, N.W. Suite 800 Washington, DC 20006-2105

Geroge M. Kizer Telecommunications Industry Association 2001 Pennsylvania Avenue Suite 800 Washington, DC 20006-1813

Robert B. Kelly Law Office of Robert B. Kelly Suite 660 1920 N Street, N.W. Washington, DC 20036

Associated Builders and Contractors 729 15th Street, N.W. Washington, DC 20005 Herbert D. Coss Baltimore Gas and Electric Company Lexington and Liberty Streets P.O. Box 1475 Baltimore, MD 21203

Albert Halprin Halprin, Mendelsohn & Goodman Suite 1020, East Tower 1301 K Street, N.W. Washington, DC 20005

Daniel E. Smith Gurman, Kurtis, Blask and Freedman Suite 500 1400 16th Street Washington, DC 20036

David Cosson National Telephone Cooperative Association 2626 Pennsylvania Avenue, N.W. Washington, DC 20037

Lawrence E. Sarjeant U S West 1020 19th Street, N.W. Suite 700 Washington, DC. 20036

H. Mark Gibson COMSEARCH 11720 Sunrise Valley Drive Reston, VA 22091

Wayne V. Black Keller and Heckman 1001 G Street, N.W. Suite 500 West Washington, DC 20001

Thomas Gutierrez Lukas, McGowan, Nace & Guitierrez 1819 H Street, N.W. 7th Floor Washington, DC 20006

Thomas Gutierrez Lukas, McGowan, Nace & Guitierrez 1819 H Street, N.W. 7th Floor Washington, DC 20006

Daniel L. Bart GTE Service Corporation 1850 M Street, N.W. Suite 1200 Washington, DC. 20036 Mary E. Landergan Capital Cities/ABC, Inc. 77 West 66th Street New York, NY 10023

Richard Rubin Fleischman and Walsh 1400 Sixteenth Street, N.W. Suite 600 Washington, DC 20036

Ellen S. Deutsch Citizens Utilities Company of California P.O.. Box 496020 Redding, CA 96049-6020

Mark W. Johnson CBS, INC. 51 West 52 Street New York, NY 10019

Michael Baly II The American Gas Association 1515 Wilson Boulevard Arlington, VA 22209

Harold R. Morrison Valero Transmission Company Post Office Box 500 San Antonio, TX 78292-0500

Chandos A. Rypinski Lace, Incorporated 921 Transport Way Petaluma, CA 94954

Michael C. Trahos Legislative Affairs Committee Region-20 Public Safety Plan Review Committee 4600 King Street Suite 4E/5N Alexandria, VA 22302

Steven R. Rivkin Law Offices of Steven R. Rivkin 1401 New York Avenue Suite 1200 Washington, DC 20005

Jack Zavitz SR Telecom, Inc. 8150 Trans-Canada Hwy. St. Laurent, Quebec Canada H4S 1M5 Thomas Ohlsson Spectralink Corporation 1650 38th Street Boulder, Co 80301

JoAnne G. Bloom Ameritech 30 South Wacker Drive Suite 3900 Chicago, IL 60606

Michael Altschul Cellular Telecommunications Industry Association 1133 21st Street, N.W. Suite 300 Washington, DC 20036

Lew Morris CYLINK Corporation 310 N. Mary Avenue Sunnyvale, CA 94086

Byron R. Bergman Tacoma Public Utilites 3628 South 35th Street P.O. Box 11007 Tacoma, WA 98411

David B. Leeson California Microwave 985 Almanor Sunnyvale, CA 94806

Michael C. Regulinski Centerior Energy Corporation 6200 Oak Tree Blvd. Independence, OH 44131

Robert L. McPhail Basin Electric Power Cooperative 1717 East Interstate Avenue Bismarck, ND 58501

Sambran Sandoval National Spectrum Managers Association P.O. Box 8378 Denver, CO 80201

Donal F. McCarthy Consolidated Edison 4 Irving Place New York, NY 10003

Brad Diard Southern Natural Gas P.O. Box 2563 Birmingham, LA 35202-2563 Richard d. Lawson 1850 M Street 11th Floor Washington, DC 20036

Robert F. Aldrich Keck, Mahin & Cate 1201 New York Ave., N.W. Penthouse Suite Washington, DC 20005

David C. Jatlow Young & Jatlow 2300 N Street, N.W.4600 King Street Suite 600 Washington, DC 20037

Dick Heineman Board of Public Utilities Incorporated City of Los Alamos P.O. Box 1057 Los Alamos, NM 87544

Thomas Gutierrez Lukas, McGowan, Nace & Guitierrez 1819 H Street, N.W. 7th Floor Washington, DC 20006

George Shannon Tarrant County Water Control and Improvement District Number One P.O. Box 4508 Fort Worth, TX 76164-0508

Thomas L. Layman Associated Electric Cooperative Sho-Me Power Electric Cooperative P. O. Box 754 Springfield, MO 65801

Von Taylor The Coastal Corporation 9 Greenway Plaza Houston, TX 77046

Terry G. Mahn Fish & Richardson 601 13th Street, N.W. 5th Floor North Washington, DC 20005

Patricia L. Wize General Motots Research Corporation P.O. Box 5121 Southfield, MI 48086-5121 David R. Mason MCI Telecommunications Corporation 400 International Parkway Richardson, TX 75081

Theodore L. Kinne Interstate Natural Gas Association of America 555 13th Street, N.W. #300W Washington, DC 20004

George Calhoun International Mobile Machines Corp. 2200 Renaissance Blvd. Suite 105 King of Prussia, PA 19406

Stephen P. Carrier Hughes Network Systems 11717 Exploration Lane Germantown, MD 20874

T. Peter Ruane American Road and Transportation Builders Association 501 School Street, S.W. Eighth Floor Washington, DC 20024

Benn Kobb The Wireless Information Networks Forum 1155 Connecticut Avenue, N.W. Suite 500 Washington, DC 20036

Arvin G. Larson I.E.E.E.-U.S.A. 1828 L Street, N.W. Suite 1202 Washington, D.C. 20036 Corn Belt Power Cooperative 1300 13th Street North P.O. Box 508 Humboldt, IA 50548-0508

George W. Toyne

David A. LaFuria Lukas, McGowan, Nace & Guitierrez 1819 H Street, N.W. 7th Floor Washington, DC 20006

Daymon G. Barton KAMO Electric Cooperative, Inc. P.O. Box 577 Vinita, OK 74301

Edward E. Jungerman Impulse Telecommunications Corporation 12720 Hillcrest Road Suite 1020 Dallas, TX 75230

Robert S. Foosaner Fleet Call, Inc. 1450 G Street, N.W. 7th Floor Washington, DC 20036

Lawrence L. Green
Department of Water and Power
City of Los Angeles
111 North Hope Street
Los Angeles, CA 90012

J. Michael Peters Western Resources, Inc. 818 Kansas Avenue Topeka, KS 66601